Lake Elsinore Advanced Pump Storage
FERC Project Number 11858

and

Talega-Escondido / Valley-Serrano
500-kV Interconnect

(LEAPS/TE-VS)

CEC Joint Committee Workshop
Transmission Corridors
May 14, 2007

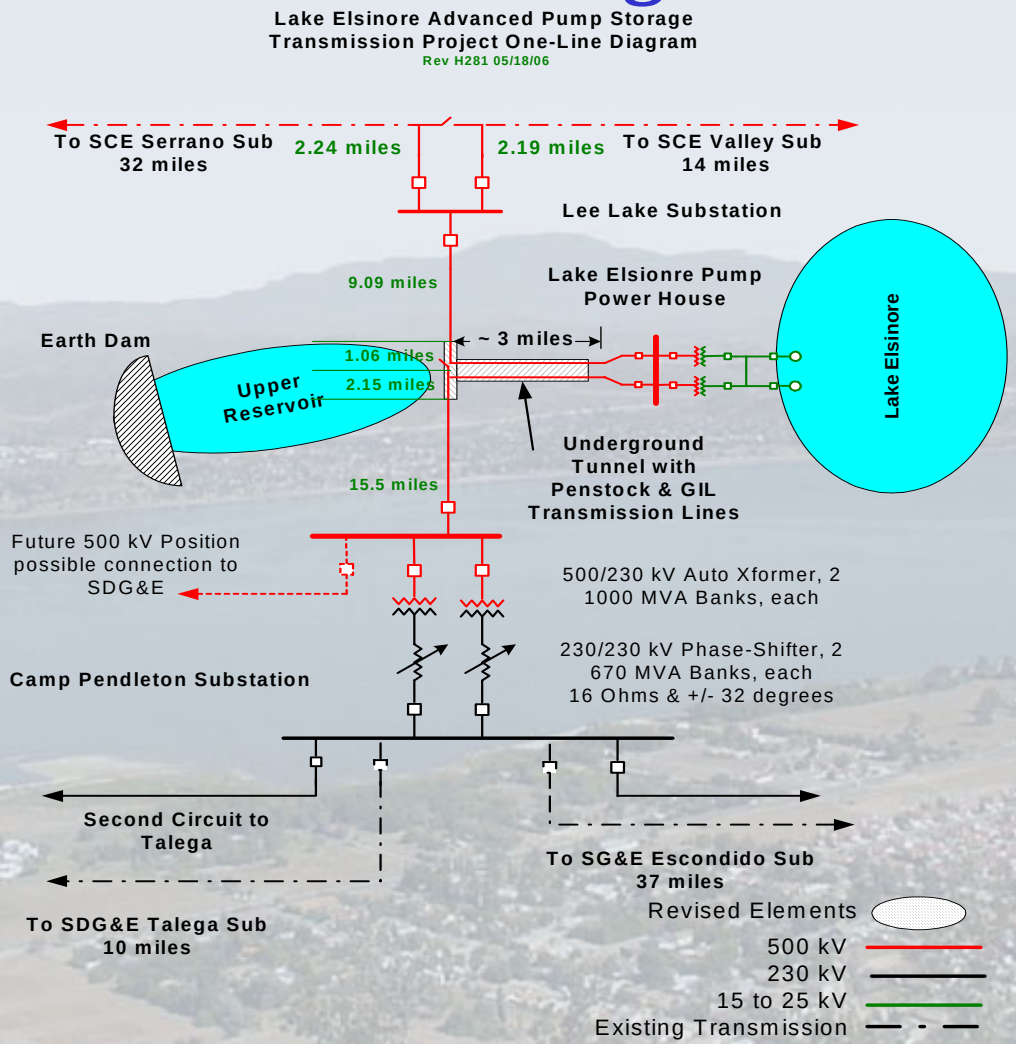
LEAPS – TE/VS Interconnect

- 500-MW advanced pumped storage + 500-kV transmission line linking SDG&E into main California Grid
- TE/VS Interconnect functions as stand-alone reliability solution to San Diego
- 500-MW of renewable storage and load-shifting intermittency management
- 500-kV link to SCE's 500 kV system
- 2007 Construction start
- Critical asset facilitating Statewide manage of renewables
- Promotes attainment of RPS and GHG goals
- Complementary to SDG&E's Sunpath to create backbone

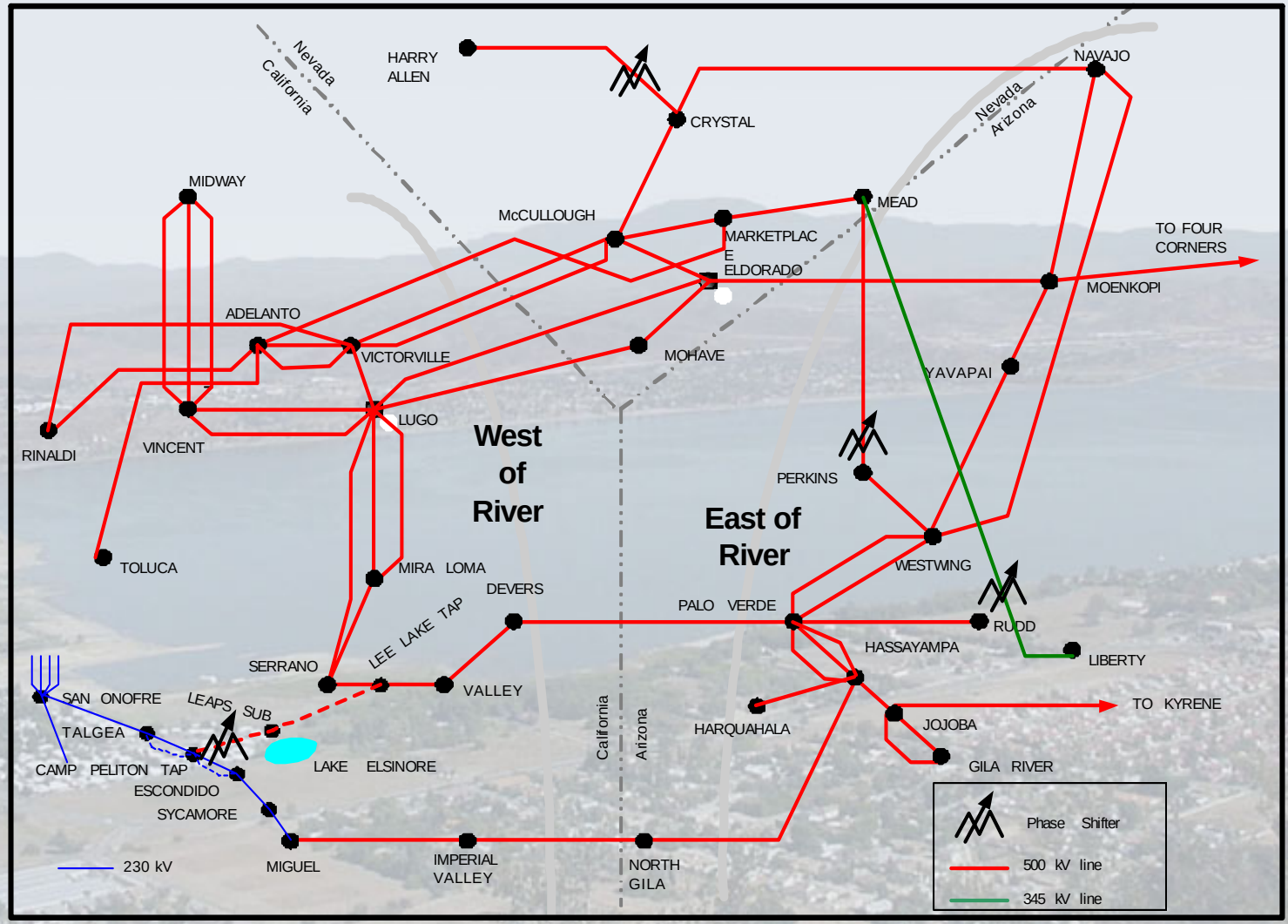
TE/VS Interconnect Project Description

- New 28.5 mile 500-kV transmission line
- 1,600-MW design capacity
- Public lands route (Cleveland National Forest)
- Only 500-kV link from San Diego to California Grid
- Links available renewable resources (e.g., Tehachapi) for use in San Diego
- System Impact Studies completed
- Grid connection graded by CAISO
- Joint FERC/Forest Service Final EIS completed

TE/VS Interconnect Single-Line Drawing



System Map and Connection



TE/VS Interconnect Benefits

- Construction can commence in 2007
  - FERC has independently validated need
  - Support of affected federal agencies (USMC, USFS, BLM)
- 1,000 MW of reliability to San Diego in 2009
- Interconnects San Diego to robust California grid
- Links to available renewable resources like Tehachapi
- 500-MW of advanced pumped storage
- Allows for storage of renewable resources
- Improves system reliability

TE/VS Interconnect Costs & Benefits

- TE/VS Cost: $350 million (without pumped storage)
- Benefits
  - Reduces San Diego area RMR/LCR requirements
  - Reduces Los Angeles Basin LCR requirements
  - Reduces MCP for energy in California
  - Access to renewable energy (e.g., Tehachapi)
  - Congestion mitigation
  - Minimal environmental costs

LEAPS Project Description

- 500-MW advanced pumped storage
- Storage off-peak renewable and non-renewable resources
- Closed-loop using Lake Elsinore and new upper reservoir
- 83.3% wire–to–wire efficiency for electricity storage
- Fully dispatchable in 15 seconds
- Operates for up to 18 continuous hours in emergency
- Other ancillary benefits

Project Status

Permitting:

- National Forest route approved by USFS August 2006
- Final EIS published by FERC and USFS January 30, 2007
- Final USFS Section 4(e) conditions published March 2007
- Draft EIR to be published Summer 2007

Connection to grid:

- SDG&E/SCE/CAISO System Impact Studies and Interconnection Studies completed
- CAISO interconnect approval granted March 2007
- SDG&E/SCE/CAISO interconnection agreements being negotiation

LEAPS Benefits to the Grid

- Store off peak to sell on peak (renewables & over-generation management)
- Dispatchable in 15 seconds (with units spinning)
- Black start in 10 minutes
- Full range of ancillary services
- Provides regulation, load following, and voltage support
- Increased system reliability
- Management and conservation of renewable resources
- FERC has identified LEAPS as “advanced transmission technology” under Energy Policy Act of 2005
- Can manage intermittent resources in real time

Pumped Storage Benefits

- Fast Start
- Fast ramp rate
- Superior Spinning Reserve
- Reliable Capacity Resource (Hydro)
- Intermediate Resource with peaking Capabilities
  - Cycle Time / Starting Cost
- Voltage Support - multi mode
- Black Start
- Significant Regulation Capability
- Thermal Generation Optimization
- Very reliable / timely starting
- Efficiency 82+%
- Fuel diversity/hedging
- Storage Volume / Weekly / Daily Cycles
- Flexibility !!

LEAPS Cost & Benefits

- LEAPS Cost: $750 million
- Benefits:
  - CAISO found $150+ million in annual benefits
  - Benefits include production cost savings, ancillary services, wind integration, over-generation and capacity
  - Additional unaccounted for benefits, including energy, RPS, greenhouse gas emission reduction, and black start

Workshop Guidelines (Eligibility Criteria)

- **Project Guidelines**
  - Needed by 2017 to ensure reliability, relieve congestion or access renewable resources.
  - Will require an EIR/EIS and/or a CPCN
- **Corridor Issues**
  - Provide access to renewables
  - Near load center and threatened by continued development
  - Needed to interconnect with existing Section 368 corridors

Project Guidelines (1)

- **Reliability** – Import 1,000 MW to San Diego
  - FERC has identified reliability benefits
- **Congestion** – Connects San Diego into the robust main grid to the north at 500 kV
- **Access renewables** – Allows San Diego access to Tehachapi and to all other renewables to be developed north of San Diego

Project Guidelines (2)

- Final EIS issued by FERC and USFS January 2007
- CEQA compliance required for Section 401 permit
- Draft EIR scheduled for release Summer 2007
- LEAPS included in alternatives analysis in SDG&E Sunpath Draft EIR
- Applicant coordinating CPCN filing with CPUC

Corridor Issues: Access to Renewables

- Direct connection to Tehachapi wind resources
- Provides path into San Diego for ALL other renewables that may be developed from San Diego to Palo Verde north
- Pumped storage allows for storage of renewables
- Facilitates attainment of RPS objectives
- Facilitates attainment of GHG emission reduction

Corridor Issues: Threatened by Development

- Public route reduces impacts to private landowners
- USFS has issued final permit conditions
- Provides only feasible 500-kV connection from San Diego into the main California grid
- Mirrors CAISO approved Valley-Rainbow connection
- Reduces need for additional peakers

Corridor Issues: Existing Corridors

- Identified by DOE as draft National Interest Electric Transmission Corridor (Section 1221, EPAct 2005)
- Identified by the USFS under Section 368
- TE/VS right-of-way utilizes eligible public lands
- Interconnects two existing transmission corridors
- Links San Diego with main California grid

Conclusions

- **Project Guidelines**
  - ✓ Needed by 2017 to ensure reliability, relieve congestion or access renewable resources.
  - ✓ Will require an EIR/EIS and/or a CPCN
- **Corridor Issues**
  - ✓ Provide access to renewables
  - ✓ Near load center and threatened by continued development
  - ✓ Needed to interconnect with existing Section 368 corridors